Amendments to the Specification

Please replace the paragraph beginning at page 3, line 4, with the following rewritten paragraph:

~~Copending~~ U.S. patents, 6,396,819 ~~applications~~, "LOW-COST SATELLITE COMMUNICATION SYSTEM", issued 28 May 2002, and 6,128,469, "SATELLITE COMMUNICATION SYSTEM WITH A SWEEPING HIGH-GAIN ANTENNA", serial ~~numbers 09/045,970 and 09/045,971, filed 3/21/98 for~~ issued 3 October 2000, to Richard Fleeter, John Hanson, Scott McDermott, and Ray Zenick, and 6,317,029, "IN SITU REMOTE SENSING", ~~serial number 09/130,854, filed 8/7/98 for~~ issued 13 November 2001 to Richard Fleeter, disclose systems and methods that facilitate the reception and processing of messages from a large number of preferably low-cost transmitters, and are each incorporated by reference herein. For example, a large number of IC chip-size transmitters may be released from an aircraft that overflies a hurricane or forest fire. These transmitters may be configured to periodically or randomly transmit their location and the atmospheric conditions at their location, such as temperature, pressure, moisture content, and so on. A receiving system receives and processes the transmissions from these many devices and provides temperature and pressure profiles, changes and trends, predictions, and the like. Such systems require simple, low-cost, and efficient transmitters.

A1

Please replace the paragraph beginning at page 6, line 20, with the following rewritten paragraph:

In this example embodiment, the receiver 210 receives the composite signal 281, demodulates the composite signal 281, and provides the message discriminator 220 with a down-converted composite signal 211 at the baseband of the encoded transmitted messages. A delay device 230 gathers a portion of the composite signal 211, the starting point of the portion defining the code-phase of the portion relative to the receiver's decoding code 202, which is the same code that is used by each of the transmitters 280a-c. If two or more transmitters 280a-c transmit at this same code-phase when this code-

A2 cont

A2 Concl

phase portion is selected, a collision results and this code-phase portion will not be decodable. If only one ~~transmitter~~ of the transmitters 280a-c is transmitting at this code-phase when the portion of the message corresponding to this code-phase is selected, the transmitted message 282a-c will be decodable at this code-phase, as discussed with regard to FIG. 1.

Please replace the paragraph beginning at page 7, line 1, with the following rewritten paragraph:

A3

Disclosed in the ~~copending~~ patents 6,128,469, 6,317,029, and 6,396,819, ~~applications~~ referenced above, there are a number of applications that include the communication of relatively short and non-critical messages from a plurality of transmitters, via satellite. The satellite preferably includes a transceiver that receives a composite signal containing the messages from the transmitters, and transmits the composite to a receiver at a ground station. The communications system 200 is particularly well suited for these applications, because a single receiver 210 at the ground station can be used to process the asynchronous communications of a large number of identical transmitters. ~~Because a~~ A typical code 202 includes a sequence of over a thousand bits, thereby forming over a thousand code-phases for each bit of a message, and thus the likelihood of two infrequently transmitting devices transmitting at exactly the same code-phase at the same time is slight. Because the messages are non-critical, the loss of messages because of this possibility of an exact phase coincidence is acceptable. For example, one application includes the sensing of moisture content over a vast geographic area. Collectively, this information is useful and significant, but the intermittent loss of reports from individual collectors would not be significant. Because the odds are in favor of subsequent or prior reports from these collectors being transmitted without collision, and the rate of change of information content from these collectors can be expected to be low, the loss of individual reports has an insignificant effect on the collective information.

Please replace the paragraph beginning at page 10, line 14, with the following rewritten paragraph:

Line 6D illustrates a down-conversion frequency 631 that is not coincident with the transmitter-dependent IF 620. For ease of understanding, the difference between the frequencies 631 and 620 is exaggerated and not illustrated to scale. Typically, the intermediate frequency is in the range of tens of megahertz, and the maximum difference between frequencies is in the range of kilohertz. As illustrated on line 6D, this difference results in the signals 610 and 610' being down-converted to +/- the difference frequency, rather than to a frequency of zero (DC), as illustrated at 641, 641'. The mis-match of envelopes 641, 641' introduces a distortion (aliasing) to the positive frequency envelope. When an in-phase decoding is performed on the composite of envelopes 641, 641', a single energy component 651 is produced substantially at the center of this envelope, which is not at the zero (DC) frequency, as illustrated at line 6E. Without aliasing, this component 651 would be at the center of envelope 641, at the difference frequency; the actual frequency of this component 651 will be dependent upon the degree of aliasing. Because this component 651 is not at the zero (DC) frequency, an embodiment that uses the DC energy level to determine whether an in-phase message element is decoded will not operate properly. Consider the transmission of a message comprising a continuous sequence of "ones". A difference frequency of 0 Hertz will produce a substantially constant positive DC level at the output of the decoder 240 of FIG. 2 ~~1~~ each time the corresponding code-phase is used. A difference frequency of 100 Hertz, on the other hand, will produce a continually changing value (at or near 100 Hertz) at the output of the decoder 240 of FIG. 2 ~~1~~ each time the corresponding code-phase is applied. This is particularly problematic when the changing value approaches and traverses the zero-level at each cycle, because this decreased level falls below the threshold value that is used to determine whether an in-phase message-element is being received.

A4

Please replace the paragraph beginning at page 11, line 12, with the following rewritten paragraph:

In an example embodiment, the intermediate frequency is nominally 21.4 MHz, the center lobe of the envelope 610 is 2.5 MHz wide, each of the side lobes is 1.25 MHz wide, and the maximum difference frequency is +/- 7.5 kHz. In this embodiment, the down-conversion frequency is selected to be 18.9 MHz, so that the entire main lobe of the down-converted envelope is near-baseband in the positive frequency domain, nominally centered at 2.5 MHz. Because of frequency variances, some aliasing may produced by the minor lobe of the down-shifted negative frequency envelope ~~632~~ 642', but is insignificant, because the energy content of the minor lobe is substantially less than the energy content of the major lobe. This down-converting to near-baseband, albeit with some aliasing, allows a sampling of the major lobe at 10 MHz, which is well within the bounds of available technology. Alternatively, the down-converted envelope can be positioned above 2.5 MHz, to eliminate the aliasing that may be caused by frequency variances. As will be evident to one of ordinary skill in the art, a different encoding scheme having a different characteristic envelope 610 can be decoded using an appropriate down-conversion to locate the down-converted envelope near-baseband with minimal aliasing. That is, a narrower bandwidth envelope can be down-converted closer to baseband than a wider bandwidth envelope.

A5